IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Applicant: de Nora et al.

Application No.: continuation of 09/978,160

Filed: concomitant Examiner: tbd

For: ALUMINIUM ELECTROWINNING CELLS HAVING A V-SHAPED CATHODE BOTTOM AND METHOD PRODUCING ALUMINIUM

PRELIMINARY AMENDMENT

In the CLAIMS:

Please cancel claims 1-26.

Please add the following new claims:

27. A cathode block for electrowinning aluminium, the block having a length and a width, the length of the block being greater than its width, the block comprising: a cathode surface which slopes down along the block's length and on which during use aluminium is produced; and a current supply bar for connection to an external electric current supply, which bar extends along the block's length below the sloping cathode surface.

28. The cathode block of claim 27, wherein the sloping cathode surface forms a single ramp along the block's length.

29. The cathode block of claim 28, comprising an arrangement that serves to delimit an area for collecting molten aluminium at a bottom end of the sloping cathode surface.

30. The cathode block of claim 29, wherein said arrangement comprises a ledge which is located below the lower end of the sloping cathode surface and which extends therealong, so that when two cathode blocks are

placed end-to-end along their ledge an aluminium collection groove is formed by the facing ledges.

31. The cathode block of claim 27, wherein the sloping cathode surface forms a pair of ramps along the block's length, the ramps being generally in a V configuration along the block's length.

32. The cathode block of claim 31, comprising an aluminium collection groove that is located at a bottom end of the sloping V-shaped cathode surface and that extends therealong.

33. The cathode block of claim 32, wherein the aluminium collection groove is located below the lower end of the sloping V-shaped cathode surface.

39. The cathode block of claim 27, wherein the sloping cathode surface is aluminium-wettable.

40. The cathode block of claim 39, wherein the sloping cathode surface is formed by an aluminium-wettable coating.

41. The cathode block of claim 40, wherein the coating comprises an aluminium-wettable refractory hard metal (RHM).

42. The cathode block of claim 41, wherein the RHM comprises at least one boride selected from titanium, zirconium, tantalum, chromium, nickel, cobalt, iron, niobium and vanadium borides.

43. The cathode block of claim 42, wherein the coating is made of sintered particles of refractory hard metal boride and particles of a colloid selected from colloidal alumina, silica, yttria, ceria, thoria, zirconia, magnesia, lithia, monoaluminium phosphate or cerium acetate.

44. The cathode block of claim 41, wherein the coating is aluminized.

45. The cathode block of claim 27, comprising carbonaceous material such as anthracite or graphite.

46. The cathode block of claim 27, comprising a bottom face along which the current supply bar extends lengthwise along the block.

47. The cathode block of claim 46, wherein the block's bottom face has a recess for receiving and embedding the current supply bar.

48. The cathode bock of claim 27, wherein the current supply bar comprises steel.

49. A cell for the electrowinning of aluminium comprising a cathode block having a length and a width, the length of the block being greater than its width, the block comprising: a cathode surface which slopes down along the block's length and on which during use aluminium is produced; and a current supply bar for connection to an external electric current supply, which bar extends along the block's length below the sloping cathode surface.

50. The cell of claim 49, wherein the cathode block extends lengthwise across the cell.

51. The cell of claim 50, comprising a series of juxtaposed cathode blocks extending in pairs arranged end-to-end across the cell.

52. The cell of claim 50, comprising a series of juxtaposed cathode blocks extending individually across the cell.

53. The cell of claim 49, comprising an aluminium collection reservoir across the cell and an aluminium

collection groove along the cell, said groove leading to the reservoir.

54. The cell of claim 53, wherein the aluminium collection groove is horizontal.

55. The cell of claim 53, wherein the aluminium collection groove slopes downwards towards the aluminium collection reservoir.

56. A method of electrowinning aluminium in a cell that contains a molten electrolyte in which alumina is dissolved, the cell comprising a cathode block which has a length and a width, the length of the cathode block being greater than its width, the block comprising:

- a cathode surface which slopes down along the block's length and on which during use aluminium is produced; and
- a current supply bar for connection to an external electric current supply, which bar extends along the block's length below the sloping cathode surface,

said method comprising passing an electric current through the current supply bar to the cathode surface to electrolyse dissolved alumina and produce aluminium cathodically.

57. The method of claim 56, comprising draining produced aluminium from the sloping cathode surface.

58. The method of claim 56, wherein the molten electrolyte is at a temperature of 730° to 960°C.

59. A cathode block for electrowinning aluminium, the block having a length and a width, the length of the cathode block being greater than its width, said block comprising: a cathode surface which slopes down along the block's length and on which during use aluminium is produced; and a bottom face which has a recess that extends along the block's length below the sloping

cathode surface to receive and embed a current supply bar for connection to an external electric current supply.

60. A cathode block for electrowinning aluminium, the block having a length and a width, the length of the cathode block being greater than its width, said block comprising: a top that forms a cathode surface which slopes down along the block's length and on which during use aluminium is produced; and a bottom arranged to receive a current supply bar extending along the block's length below the sloping cathode surface for connection to an external electric current supply.

REMARKS

Applicants have preliminarily amended the application. Support for the claims presented herein is present in the application as filed. The Examiner is urged to enter the amendment and examine the new claims.

Respectfully submitted,

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